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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,736	07/24/2003	In-gu Kwak	1349.1257	8060

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STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER

LEE, PETER

ART UNIT	PAPER NUMBER
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2852

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/625,736

Applicant(s)

KWAK, IN-GU

Examiner

Peter Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7,9-12,14-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Amendment

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4-7, 9, 11-12, 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirst et al. (US pn 6580895) in view of Lee (US 6,665,515) and further in view of Romem (US 2004/0258440; PCT/IL01/01008).

1. Hirst teaches an image fixing system (Fig. 2 reference 102) of an electro-photographic imaging device (Fig. 1 part 100) comprising: a photoconductive drum (part 106) (ie. first roller), a developing roller (part 112) (ie. developer), a transfer roller (part 128) (ie. second roller), a fusing system (part 102) comprising: a pressure roller (Fig. 2 part 138); a heating element (Fig. 2 part 214); and a fuser roller (Fig. 2 part 136) (ie. heating roller/third roller), the heating member being installed inside of the fuser roller (Fig. 2), to rotate with the pressure roller to fix a developed image to a fed paper by applying heat generated by the heating element (col. 3 line 60 – col. 4 line 5), the heating element is taught to possibly be an induction heating element (col. 5 lines 63-65) (ie. induction heating coil), wherein the fuser roller is comprised of a coaxial outer tube (Fig. 2 part 212) that surrounds an inner tube (Fig. 2 part 210) (ie. a heat pipe of a closed tube type), and a temperature sensor (fig. 2 part 202) to detect a temperature of the fuser roller.

Hirst also teaches an electrophotographic imaging device comprising of a fuser roller and

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a pressure roller that are rotated so that a recording material may pass in between through a nip in order to fuse a toner image to the surface of the recording material (col. 3 line 66 – col. 4 line 3), and the fuser roller is equipped with an interior space filled with a liquid, for example water, to provide a mechanism to ensure temperature equalization across the nip parallel to the axis (col. 6 line 56-60) (ie. outer surface having a uniform surface temperature); the heating element is used in conjunction with the fusing system to heat the fuser roller and distribute the heat evenly along the nip (col. 7 lines 13-27) (ie. heater to heat the outer surface to the uniform surface temperature).

Hirst further teaches the fuser roller having an inner and outer tube preferably made of copper metal (ie. conductor) which together form an interior space (Fig. 4 part 306).

Hirst also teaches that once the fusing system (Fig. 1 part 102) is heated up to operating temperature by the internal heating element (Fig 4 part 214), the liquid (ie. working fluid) inside the interior space of the fuser roller (Fig. 4 part 306) (ie. working fluid circulated within the space) is vaporized (ie. fluid changes phase according to the heat generated).

Hirst does not teach the temperature sensor being connected to a control unit to control a power being supplied to the fuser roller based on a detected temperature. Although Hirst teaches the use of water to fill in the interior space formed between the inner and outer tubes (col. 6 lines 37-40), Hirst does not teach the liquid to be specifically distilled water. Nor does Hirst teach the inner tube containing the heating element being rotated in an opposite direction from the outer tube.

Lee teaches the use of a thermostat (fig. 3 part 119) (ie. temperature sensor) being installed above a fusing roller, similar to the invention taught by Hirst, and further teaches that

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the power being supplied to the fusing roller will be cut off when the temperature is detected to be rapidly increasing (col. 4 lines 63-67) (ie. control a power supplied to heating roller based upon the detected temperature). Lee also teaches the specific use of water and/or distilled water for filling up an internal space within a fixing roller (col. 5 lines 42-48) when the heat piping is made of copper, which is what the tubing taught by Hirst is disclosed to be made of as mentioned above.

Romem teaches a fusing drum (fig. 2A part 10) with an outer cylinder (part 16) and an inner cylinder (part 18) that has a working liquid (part 20) used to fill the space in between the two. The inner cylinder is taught to have a heating element (part 11). The outer cylinder is taught to rotate in an opposite direction as the inner cylinder (paragraph [0007]) (ie. rotate in opposite directions/rotate separately).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Hirst to have a means for controlling a power supplied to a fusing roller and using distilled water specifically within an interior space of the fusing roller as taught by Lee. One of ordinary skill in the art would have been motivated to control the power to a fusing roller in order to prevent overheating of the fusing roller (col. 4 lines 61-67), and use distilled water because of the advantages of low cost and prevention of environmental pollution (col.5 lines 41-47).

2. Claim 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over over Hirst et al. (US pn 6580895; from hereon will be referred to as Hirst(1)) in view of Lee (US 6,665,515) and in view of Romem (US 2004/0258440; PCT/IL01/01008) as applied to claims 1,

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4-7, 9, 11-12, 14-16 above, and further in view of Hirst et al. (US pn 6721530; from hereon will be referred to as Hirst(2)).

Hirst(1) in view of Lee and in view of Romem teach the limitations to the claims supra.

Hirst(1) in view of Lee and in view of Romem does not explicitly teach a heating coil and an inner conductor generating heat in response to a change in a magnetic field generated by the heating coil.

Hirst(2) teaches the use of an induction heating element inside of a fuser roller (ie. heating roller) to generate a high frequency magnetic field to induce heat (col. 1 lines 52-58).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the heating element used in the invention of Hirst(1) in view of Lee and in view of Romem to create a magnetic field within the fuser roller as taught in Hirst (2). One of ordinary skill in the art would have been motivated to use such an induction heating element because it has the advantage over other conventional heating methods such as the ability to heat up the roller quickly without increasing energy use, not requiring a sliding contact between the coil and the inner surface of the fuser roller, and it provides greater temperature control (col. 1 line 59- col. 2 line 3 Hirst (2)).

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Amendment

Amendments to the claims and specification have been entered.

Response to Arguments

4. Applicant's arguments with respect to claims 1, 3-6, 7, 9-12, 14-17 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues on page 6 of the response that the internal heating element of Hirst (1) does not rotate in an opposite direction as the heating roller. Because this limitation was not present in the original claims but rather amended to include them, a new reference has been found in Lee to read upon the limitation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Lee whose telephone number is 571-272-2846. The examiner can normally be reached on mon-fri 9:00 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Arthur Grimley can be reached on 571-272-2136. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PL 3/29/2005



Arthur T. Grimley
Supervisory Patent Examiner
Technology Center 2800